

Labs Team Makes Major Contributions To Experimental Seismic Station in Norway

The Finnmark district of Norway is remote — 200 miles north of the Arctic Circle. And it's wet — a lot of fog and rain. Yet this unlikely spot, the site of a new experimental seismic station, may well open some research doors to more effective ways of verifying compliance with future nuclear test ban treaties.

Installation of FINNESS (FINnmark Experimental Seismic System), near the small town of Karasjok, some 650 miles northeast of Oslo, was completed Sept. 29. The facility is designed specifically to detect and locate weak seismic signals from underground nuclear explosions.

Second Norwegian Array

FINNESS is the second such array to be installed in Norway. (The first, NORESS — NORwegian REgional Seismic Station — built in 1984, is located near Hamar, a little more than 60 miles north of Oslo.) FINNESS, funded by the DoD's Defense Advanced Research Project Agency (DARPA), is a duplicate of its sister facility to the south. Both unmanned array stations continuously collect and transmit data that can be used to detect, locate, and identify seismic events.

So why the second facility? "The two arrays can, through a central 'smart' processor, exchange seismic data and location estimates associated with a single event," says Pres Herrington, supervisor of Monitoring Systems Div. 9243. "It's been demonstrated that combining data and results from two sources — for the same event — can result in a significant improvement in both detection and location capabilities."

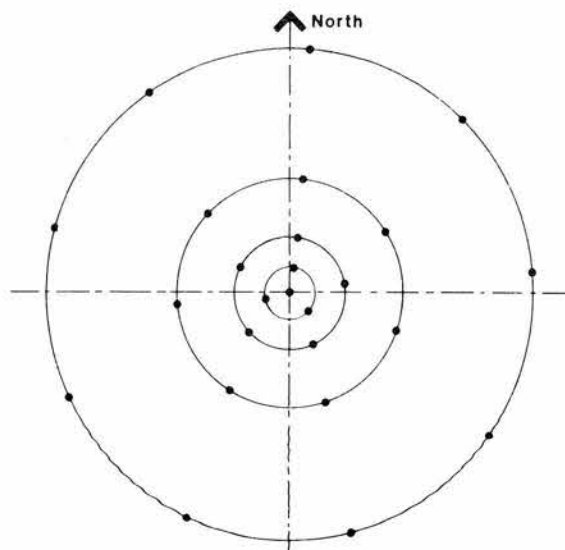
Labs Contribution

Although the seismometers (sensors) themselves were commercial "off-the-shelf" items, a team of Sandians — working on the project since May 1986 — was responsible for design, development, and installation of instrumentation and data collection hardware for FINNESS. (Sandia had similar responsibilities for NORESS.) The last major step before facility installation was four months of work (April-Aug. 1987) on system testing and calibration at the Facility for Calibration and Test (FACT) in Coyote Canyon.

FINNESS, like NORESS, consists of a central seismometer and 24 others arranged in four concentric circles around a hub site and within a 1.9-mile-diam. area. This "distributed-array" approach allows the system to locate the source of seismic signals — a necessary requirement for treaty verification. An odd number of seismometers in each circle (see diagram) enhances the uniformity of response to seismic disturbances in all directions.

Signals from the seismometers are combined

(Continued on Page Four)



FINNESS ARRAY GEOMETRY: 25 seismometers are located at positions marked by dots. (Outer ring is 1.9 miles in diameter.)



NO ROAD ACCESS to the FINNESS site meant that instrumentation had to be hauled in by helicopter. Here, Pres Herrington and Charles Rethy (both 9243) get ready for the next delivery.

LAB NEWS

VOL. 39, NO. 24 SANDIA NATIONAL LABORATORIES DECEMBER 4, 1987

Technet Poised to Tap New Mexico's Information Resources

Early this week Senators Pete Domenici and Jeff Bingaman joined the New Mexico Bar in announcing LegalEd, a statewide effort using live, interactive instructional television to deliver continuing legal-education courses to practicing attorneys across the state.

It's Technet that helps make LegalEd possible.

The live seminars from UNM will be telecast to classrooms throughout the state using existing microwave systems and the new high-speed, high-capacity, fiber-optic network operated by New Mexico Technet, Inc., a nonprofit organization currently funded by DOE and the state of New Mexico.

"The 'teleclassing' represented by LegalEd is an exciting expansion of the original Technet concept," said Domenici. "Originally, we envisioned a fiber-optic network that would enable the high-speed exchange of data in text format among the national laboratories, the universities, and some private industries along the Rio Grande Corridor."

Technet is that — and much more.

Up and Running

"The Technet communications system — a digital, fiber-optic-based network that uses pulses of light to transmit voice, data, video, and facsimile telecommunications through hair-thin fibers — already links Sandia, LANL, UNM, New Mexico State, New Mexico Tech, and state government offices," says Larry Bertholf (2600).

"Links with the USAF Weapons Laboratory and White Sands Missile Range are in the planning stage," continues Larry, "and other links are coming, but

the system is now operating and offers an array of capabilities."

Technet services to subscribers include electronic mail, bulletin board, file transfer, data-base access, and connection to remote network services — all designed originally to promote industrial development within New Mexico and to facilitate technology transfer from the national laboratories into the public and private sectors of the state's economy.

Technet Available to Sandians

Some users have already signed up.

Nora Armijo (3731) says Purchasing eagerly anticipates using the network's procurement data base. "Think how nice it will be," she says, "to get a computer printout of a list of all the suppliers handling, for example, a particular semiconductor. The network would also provide a more efficient way of enhancing our Minority Outreach Program, because we could simply ask for a listing of, say, all the firms in Albuquerque that do consulting and are minority-owned."

"And the network could save our Purchasing Planning Division time and effort in keeping up-to-date on Federal Acquisition Regulations. Compare punching in a command on the computer for a list of the newest regulations with the current time-consuming method of searching endlessly through manuals."

"We also hope that sometime in the future it will be possible to use the electronic communica-

(Continued on Page Five)

Antojitos

One of My Most Poplar Columns Ever -- Your attention is directed to the Parade Ground north of Tech Area I (you south-siders will have to ascend your high-rises). Right, no trees along the Parade Ground's south side. And the others will have to come out later.

It's not that the Visiting Officers' Quarters needs firewood. It's that the 40-year-old poplars are/were rapidly succumbing to the ravages of age. It's the first, and so far most visible, step toward a total overhaul of the place. Eventually, there will be major re-landscaping -- park benches, an exercise path, and other facilities. The aim is to create, says the Base PIO, a better "living space" for Kirtlanders.

(Some Sandians, I understand, were among those who planted the poplars decades ago. If you were one of them, give me a call. We need a photo of you and some of the remaining trees.)

Remember that, as we bid a lingering farewell to the landmark known as the Parade Ground, we'll be slowly greeting the new one rising in its place -- Hardin Field, named after AF Lt. Gen. Ernest "Moose" Hardin (1916-1986). After he retired from the Air Force, Moose served six years with DOE/AL, the last five as Assistant to the Manager.

* * *

We Note with Sadness the death of a Sandia founder. The contingent that left Los Alamos for Albuquerque just after WWII was known as Z Division. It was not called that because it was the end-of-the-alphabet group departing for the end of the NM physics world; it was called that because it was headed by Jerrold Zacharias, who had left MIT's radiation laboratory to join Los Alamos in 1945. He died recently at the age of 81.

Zacharias proposed, in a memo he wrote on Aug. 6, 1945 (the day the Little Boy was dropped on Hiroshima), that part of his Z Division be moved to what was then Oxnard Field (but would soon become known as Sandia Base to distinguish it from an Oxnard Field in California) to work on weapon assembly tasks. His memo also predicted that the division would have to grow. Both proposal and prediction proved prophetic.

Zacharias didn't spend much time in New Mexico (he returned to MIT in 1946), but he played an important role in Sandia's history.

* * *

Speaking of Los Alamos, we note that LANL is closing down from Dec. 24 to Jan. 3 this year. "Employees will be allowed to [read "must"] use either vacation or leave without pay for Dec. 28, 29, 30, and 31," says the press release. Ah, yes, that's the way Sandia began its Christmas shutdown in the mid-70s. Later, we moved several minor holidays to that period, thus avoiding the wailing and gnashing of teeth currently under way in Los Alamos.

* * *

Brits Don't Brag The official bio of Robert Ridley (a member of the United Kingdom's Ministry of Defence group whose photo we ran last issue) notes that "His interests include sailing and skiing (slowly)." Refreshing candor, that. ●BH

* * *

Del árbol caído todos hacen leña. (From a fallen tree, everybody makes wood, or "It's an ill wind that blows no good.")

Welcome to Livermore

California

Carol Fronczek (8522), Tracy
Linda Lightfoot (8522), Livermore
Patricia Miller (8522), Livermore
Duane Outka (8343), Pleasanton
Emily Soares (8522), Tracy

Massachusetts

Jeffrey Gray (8357)

Utah

Larry Baxter (8361)

Videotape Now in Library

A 3-hour videotape of the Nov. 5 Management Briefing (LAB NEWS, Nov. 20) is now available in the Tech Library (Rm. 9). Although it may be checked out by any Sandian, managers and supervisors are encouraged to use it as a focus for discussion in department- or division-wide meetings. The tape is Internal Use Only.

Welcome

Albuquerque

Ramona Gauna (121)

California

Carol Adkins (1831)

Massachusetts

Mollie Thompson (6233)

Fun & Games

Bowling -- Winners of the Best Ball Tournament at Iceland Bowl on Nov. 14-15 were Sal (7412) and Suzan (SERP) Baldonado, with a 729 combined handicap series. Second place went to Theresa (3533) and Michael (7818) Carson, with a 719 combined handicap series.

The next tournament -- a No Tap/Scotch Doubles -- will be at Holiday Bowl on Jan. 16-17.

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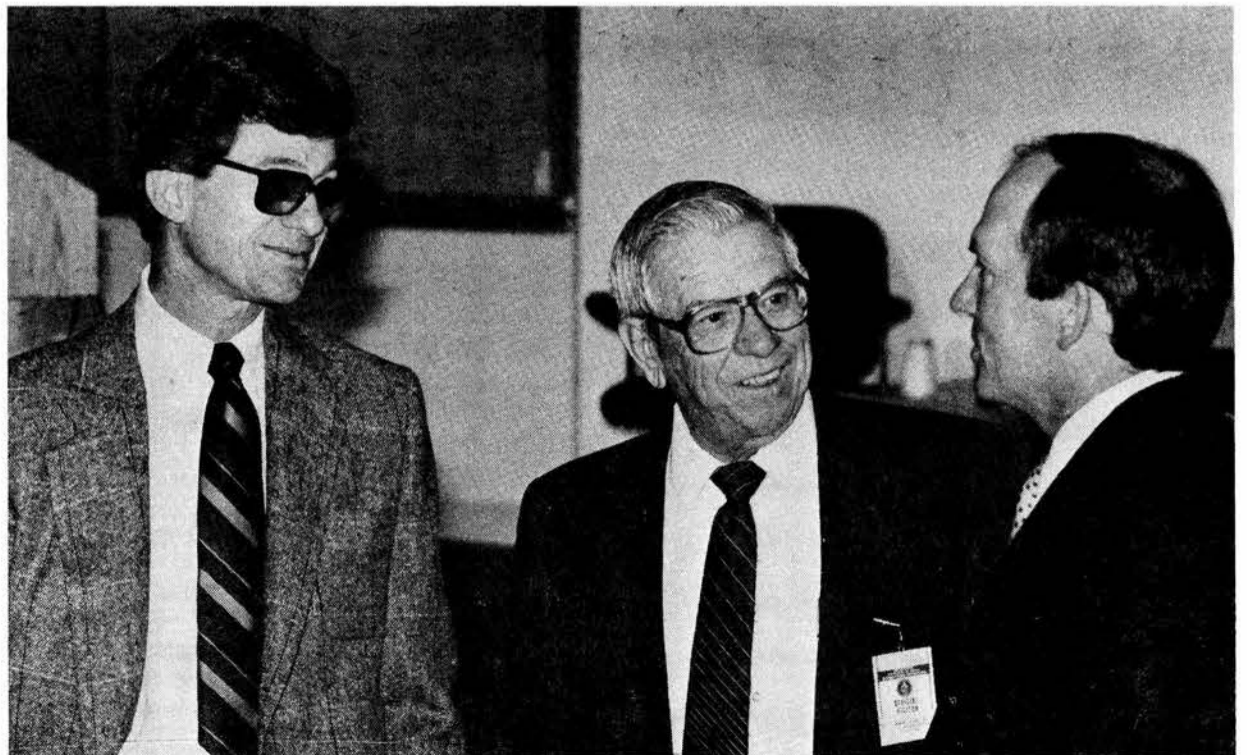
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IMPLICATIONS of the nation's trade and budget deficits on Sandia programs were among the topics covered by NM's senior member of the US House of Representatives, Manuel Lujan, Jr., in a standing-room-only colloquium presentation on Nov. 23. Congressional responses to those problems, such as the Gramm-Rudman-Hollings II legislation, "will not substantially affect Sandia," Lujan noted. Before his presentation, Lujan chatted with Everett Beckner (5000, left) and Dan Hartley (6000, right).

Optical Proximity Fuze Improves Anti-Tank Shell

With their nearly impenetrable armor, modern Soviet-bloc tanks pose an increasing threat to NATO ground forces in Europe. So the problem is simple — find a way to “take out” the tanks.

Three years ago, then-new hire Thomas Harrison (8143) and his colleagues were asked to look for a solution to that problem. Since then they have designed a laboratory prototype of an optical proximity fuze, based on laser ranging, that promises to put a modern well-armed tank at risk. DOE is now seeking a patent on the fuze.

“Armor technology is at such an advanced state today that you don’t simply fire a slug at a tank and expect it to pierce the armor,” Thomas explains. “You have to come up with more sophisticated weapons, such as shaped [directional] charges, that can be detonated from a flying projectile closing in on the tank.”

The success of such a charge being thrust at high velocity into the target depends on split-second timing and its proximity to the tank. “The projectile has to sense when it is close enough to release the shaped charge,” says Thomas. “All of this must happen very quickly because the shell could be traveling at twice the speed of sound. If the charge doesn’t go off at just the right time — five or 10 feet from the target, say — then it’s like hurling a rock at a wall — it just bounces off.”

Existing technology has produced various electronic-based systems that measure the distance between target and shell and detonate the shaped charge. The challenge was to design a fuzing system that is rugged, simple, as reliable as present fuzes, and, ultimately, lower in cost than these high-performance electronic systems.

Laser Embedded in Shell

For their final prototype system, Thomas and his team propose to embed a laser into a dummy projectile, or shell. The laser would send out a pulse at the speed of light (about 186,000 miles/second, roughly a million times faster than the speed of sound). This pulse would contact the target ahead and bounce back to the shell.

The shell, of course, travels much slower. As the laser beam is streaming toward the target and returning, a small fraction of the beam is bled off into an optical fiber coiled inside the shell. The optical fiber is cut to a length corresponding to the desired distance from the target at which the shaped charge should be detonated. As each pulsed beam returns to the projectile, it is matched with the fraction of the beam exiting the optical fiber. When both signals coincide, it means the shell is just the right distance from the target. An electronic circuit senses the coincidence and sends a signal to a detonator, which then initiates the shaped charge.

“You need a very precise, very stable time base,” says Thomas. “We know the precise speed of the laser pulse through air and through the optical fiber. So the time base provided by this optical proximity fuze is simple and reliable. It’s rugged enough to survive the environment a projectile experiences when it’s fired. And it won’t change, even over many years of storage.”

Another advantage of a laser beam over existing radar methods is that the laser stays collimated (focused to a small point); radar covers a broad space ahead of it so it could be fooled by other objects in its path. But there are still problems to be worked out — the laser system can be affected by shadows and dense foliage.

Thomas praises Sandia Livermore management for dedicating a mobile office and lab building to new hires who haven’t yet received their clearances: “We were given an immediate laboratory environment where we could use the latest in electronics, do useful research, and make a contribution to Sandia’s mission even before we went inside the fence to join our divisions.”

Working with Thomas on the optical proximity fuze, which resulted in a SAND report and patent



GATHERED AROUND the prototype of their optical proximity fuze are (from left) Thomas Harrison (8143), Mike Stewart (8144), Dean Clark (8143), Bob Oetken (8143), and Rene Bierbaum (8474).



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Take Note

Rob Rinne (8470) participated in the 9th German-American Roundtable on NATO Modernization, Arms Control, and East-West Relations held in Washington Oct. 29-30. He was an invited speaker at the conference attended by some 100 leaders of the Federal Republic of Germany and US security communities. Rob covered the manner and extent that technologies may substitute for manpower by the turn of the century. The keynote speaker, West German Defense Minister Mansfield Wörner, was introduced by Secretary of Defense Caspar Weinberger. Among the other speakers were Sen. John Warner (R-Va.), Sen. Sam Nunn (D-Ga.), Sen. Dan Quayle (R-Ind.), Special Adviser to the President Paul Nitze, Undersecretary of Defense Fred Ikle, and Undersecretary of State Allen Wallis.

* * *

Dick Rohde (8310) was recently appointed technical editor of ASME’s *Journal of Engineering and Materials Technology*. From 1988 to 1990, he will be responsible for setting the direction of the journal, coordinating technical reviews, and making publication decisions on papers that address research in various branches of materials engineering (constitutive properties, creep, fatigue, materials processing, and test procedures).

application, were Rene Bierbaum (8474), Dean Clark (8143), Bob Oetken (8142), and Mike Stewart (8144), all new and uncleared employees at the time of their joint research project.

Dubious Distinction



Worry affects the circulation, the heart, the glands, the whole nervous system. I have never known a man who died from overwork, but many who died from doubt.

Charles Mayo, *Spotlite*



LIVERMORE RETIREE Harold Brint (8272)

Death

Donald Knapple of Communications and Drawing Control Division 8273 died suddenly on Nov. 13. He was 49.

Don had been employed at Sandia Livermore for 25 years.

Survivors include his stepmother and stepsister, both of Livermore.



WINNER — Curt Specht (8445) entered his red '65 Chevy Corvette sport coupe in the recent Manteca Pumpkin Fair car show and took first place out of 38 “Vettes” in the competition. His car was also judged third-best overall among the 203 vehicles on display. This classic has a 327-cu.-in., 350-hp engine. Curt has owned it for about eight months.



(Continued from Page One)

FINESS

in ways that enhance very weak seismic signals that might otherwise be submerged in background noise — a significant capability, according to Pres.

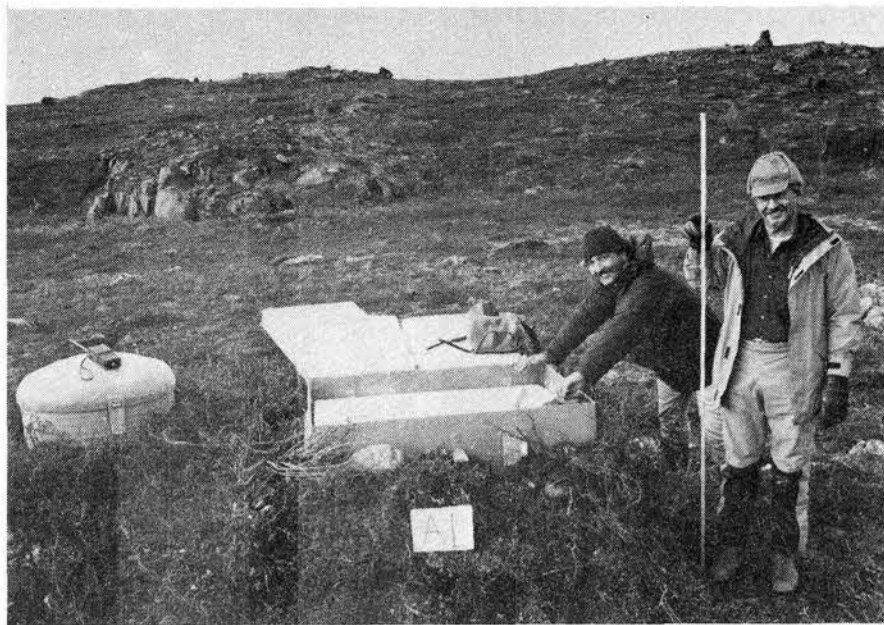
“The ability to detect signals from low-yield underground nuclear explosions would be extremely important if there’s a need to monitor compliance with a comprehensive or low-yield-threshold test ban treaty,” he points out. “We hope FINESS and NORESS will demonstrate a capability beyond what we have now to detect and locate lower-yield events.”

Regional Distances

The seismometers are designed to do their best detection work on seismic events at regional distances — within 2000 km (some 1240 miles). Twenty-one of the seismometers measure vertical ground motion only; the other four are three-axis seismometers and can record motions in the vertical, north-south, and east-west directions. All operate in the 1 to 10 Hz range and are thus capable of measuring short-period, high-frequency events — the kind particularly associated with underground explosions.

There’s also a three-axis unit (0.02 to 2.0 Hz range) in a borehole at the center of the array to measure intermediate and long-period seismic signals.

Each of the 24 outlying seismometers is installed in a partially buried concrete and fiberglass housing. The housing contains Sandia-designed electronics to amplify seismic signals, circuits to convert



JERRY SILVA (9243, left) and Alex Griego (7135) calibrate a fiber optics communication system for one of the FINESS seismometers.

signals from analog to digital form, data-authentication circuits, seismometer calibration circuits, and optical transmitters and receivers.

FINESS data will be transmitted, via satellite, to four receiving stations, including one at SNLA. Others are NORSAR (NORwegian Seismic ARray), Kjeller, Norway; the Center for Seismic Studies, Arlington, Va.; and Lawrence Livermore National Laboratory. Sandia will be looking at the data indicating FINESS’s “state of health,” according to Pres. “We want to be sure that the facility is operating as planned, and will continue to operate that way,” he says. “We’re also responsible for data authentication and archiving.” (For more on data authentication, see LAB NEWS, April 13, 1984.)

NORESS data are currently transmitted to the three US analysis centers via satellite, and to NORSAR by telephone line. (Satellite transmission will eventually also be used for information going to NORSAR, according to Pres.)

Besides Pres, Labs people who worked on FINESS in Norway include Bob Corbell (9111), project leader; Dave Lee (9243), mechanical and thermal design analysis; Jerry Silva, Richard Lucero, and Charles Rethy (all 9243), instrumentation, development testing, and installation; Alex Griego (7135), field support logistics and installation; George Patton (9111), seismometers and borehole system; Dick Kromer (9111), high-frequency system; and Bill Goldrick (9233), test results analysis. ●PW

Pass the Green Chile, Please

Life in Norway

“It wasn’t easy getting to work in the morning,” says Pres Herrington (9243), as he describes Sandia’s role in the recent installation of FINESS, a seismic station near the little town of Karasjok, Norway. “It was a two-mile walk in [to the site] over some pretty rugged terrain — and, of course, a two-mile walk out at the end of the day.”

So why the shanks’-mare commute; why not build a road and drive in? “The locals [Saami, formerly called Laplanders] weren’t about to let us build a road to the site, because it would have interfered with reindeer migration paths,” explains Pres.

Helicopters and ATVs

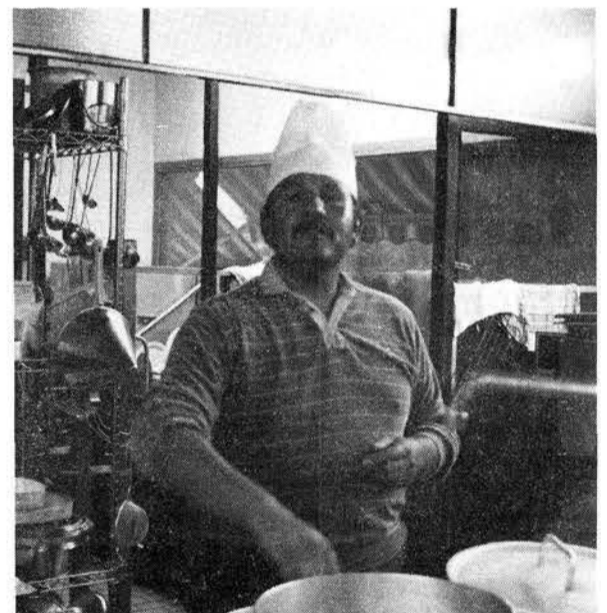
Lack of a road also posed a transportation logistics problem for moving instrumentation and other equipment to the site. Helicopters hauled in large cargo nets full of instrumentation, and

all-terrain vehicles were used for transporting light-weight items.

Pres, along with Bob Corbell (9111) and Jerry Silva (9243), stayed in Karasjok the entire month of September while FINESS installation was being completed. Alex Griego (7135) was on site even longer; he arrived in mid-August. Other members of the Sandia project team were there for shorter periods.

“The people at the hotel where we were staying were most accommodating,” recalls Pres. “In fact, one of our Norwegian colleagues even persuaded the chef to let Jerry Silva invade the kitchen, where he whipped up some fantastic chile con queso.

“There we were — a bunch of New Mexicans looking for a chile fix — so Jerry’s efforts really hit the spot!”



KING OF ALL HE SURVEYS — or so it would appear — is Jerry Silva, as he takes over the kitchen at the hotel to stir up some chile con queso.

Medical Corner

HealthNet New Mexico Campaign Returns to Sandia

By Susan Harris (3330)

January 1988 marks the kickoff of HealthNet New Mexico’s second year. I urge all Sandians to take part in the programs offered.

HealthNet will again encourage New Mexicans to improve their eating and exercise behaviors, and discourage the use of tobacco.

In 1988, three behavior-change programs will be conducted: Eat Right New Mexico (January-March), Get Fit New Mexico (March-May), and Tobacco Free New Mexico (May-July). Each program will last ten weeks.

The first campaign, Eat Right New Mexico, will begin the week of Jan. 11. Its goal is to improve nutrition practices and promote weight loss, if needed, in a proper manner. Eat Right rewards a minimum weight loss of five pounds in 10 weeks and suggests that two pounds a week be the maximum weight loss goal for participants in the program.

The Sandia Cafeteria, Bldg. 861, will offer a

special “Eat Right” meal each day of the 10-week program. An official weigh-in will be held in the Cafeteria on Fridays between 11 a.m. and 1 p.m. During that time, participants can record progress and enjoy their Eat Right meal together. (A weight scale is always in Bldg. 861 near the entrance, so you can weigh in any day of the week.) All Eat Right participants will be eligible to enter the free “HealthNet meal” drawing that will be held each week. Winners of the drawing will be picked each Thursday.

Sandians can sign up for the program in T-13, the trailer south of Medical. A \$5 registration fee will be collected — checks please.

“Sign-out/Weigh-out” week begins March 20. If you stick with the program for the entire ten weeks, you will receive an Eat Right T-shirt. Also, if you needed to lose at least five pounds and *did*, you will be awarded an Eat Right pin.

Please — Get involved! Get your family and

friends involved! Get your organization involved! And if you want more information, call me on 4-0713 or 4-8238.

Nephrologist to Speak

Dr. Dale Erickson, an Albuquerque nephrologist (kidney specialist), will speak on “Obesity, High Blood Pressure, and Exercise” at a TLC Luncheon Lecture this Monday, Dec. 7, from noon to 1 in the Technology Transfer Center.

Dr. Erickson is co-director of THIN (The Health Institute of New Mexico). As a nephrologist, he deals with the related problems of obesity and hypertension. He is the author of medical journal articles on electrolyte balance in long-distance training, and he is also a popular speaker for both medical and lay groups.

Guests are welcome.

Technet

tions capabilities of Technet to send RFQs to suppliers and to get electronic responses back from them," Nora continues. "This would reduce the paperwork and the time required to receive responses from suppliers."

Jerry Hanks (7863) looks forward to Plant Engineering's use of Technet for some of the same reasons. But he would also like to use the network for a kind of neighborly technology transfer. "Say we have a special problem we are having difficulty solving," says Jerry. "We could send out a message asking those who have faced a similar problem to share their solution with us. It could go the other way too. We might be able to supply a solution to someone else's problem."

"This kind of exchange," he continues, "could lead to stronger ties and to a better relationship between the national labs and private industry in New Mexico, which was part of the original intent when Technet was formed."

Chris Morgan (3142), past chair of the Rio Grande Chapter of the Association for Computing Machinery, says that organization is really hurting for a good electronic mail system. She's looking to Technet to provide that service. "The systems we've been using are very slow," she says. "It can take as long as overnight or a couple of days for the systems to communicate with each other. Technet is faster and much easier to use."

"And," Chris adds, "we're also looking to Technet to solve another problem that's rather silly—but sometimes silly little problems can be the most vexing. The Association needs a common file repository — one comprehensive membership list accessible to many members. We sometimes have a member in Los Alamos, for example, who would like to generate a mailing list. Another time it might be a member in, say, Gallup or Las Cruces who would like to access the list. Technet will soon be able to provide this service for us."

Technet and Telecasting

Stan Love (3522) says that though his Continuing Technical Education and Training Division is not currently using Technet's fiber-optic system, plans are in the works to make rather substantial use of it. "We're working with Technet right now to identify equipment that will allow us to receive courses originating at New Mexico Tech and New Mexico State," Stan says. "These transmissions — like all current transmissions of 'live' video courses — will involve the use of at least two of the available technologies — satellite, ITFS/microwave, and, of course, the new fiber optics."

"But," he continues, "we'll be experimenting in January with a new technology — 2-way compressed video. This will be fiber-optic all the way, and strictly digital. Some people have referred to this



TECHNET'S COMMUNICATIONS SYSTEM — a fiber-optics network linking Sandia, LANL, the state's universities, state and federal government offices, and some private industries along the Rio Grande Corridor — is the subject of discussion by (from left) Glenn Kuswa (4030); Marlin Macky, executive vice-president of New Mexico Technet, Inc.; Martha Buddecke, founding director and member of the board as Senator Domenici's representative; and Larry Bertholf (2600).

as the 'paperless' course because the instructor's lecture will be delivered via video — as will students' responses, including their homework. While I doubt there will ever be a completely paperless course, we are using more and more electronic assistance in the courses we offer, and fiber optics presents another option."

"Teleclassing' and 'teleconferencing' may be the areas in which fiber-optic systems really come into their own," says Glenn Kuswa (4030). "Both of these make good use of the large data-flow afforded by fiber optics. We expect also that the Technet link will be useful for data-sharing between Sandia and distant technical projects that we support. These, of course, would have to be projects involving only unclassified data. One division here at Sandia, for example, has already expressed interest in sponsoring research in artificial vision at UNM. Technet would allow data between the two sites to be shared

rapidly, making it possible to share expensive equipment rather than duplicating it at both sites.

"Another potential use of Technet," notes Glenn, "is technology transfer. We're expecting to form a consortium for commercializing technologies developed at the major labs and the universities. Technet could speed the process of making agreements, doing market surveys, developing business plans, and perhaps even getting financing. Even though many of the institutions are in the Albuquerque area, a local electronic mail network would be extremely useful."

If you'd like to become a part of Technet, call Jim Porter (2648) on 4-7640. "All you need to tie in to the network," he says, "is a personal computer or a terminal that has access to the terminal-switching network. I'll establish a user account for you and authorize access to the system." Technet operates on systems that do not process classified data and are not connected to any systems that do. ●DR



AT ITS RECENT ANNUAL MEETING, the Government-Industry Data Exchange Program (GIDEP) presented Sandia its Industry GIDEP Achievement Award for CY86. The award goes to the organization demonstrating the most outstanding GIDEP program participation during the previous year. Displaying the award plaque are VP Larry Anderson (2000, center), Pat DeTevis (left), and Mike Michnovicz (both 2833). GIDEP's purpose is to help its 1000 government and industry members hold down costs through the exchange of technical information, thus eliminating duplication of effort. Mike and Pat administer the program at SNL.

Supervisory Appointments



BOB HOSTETLER (9234)

ROBERT HOSTETLER to supervisor of Sensor Systems Division IV 9234, effective Oct. 16.

Bob joined Sandia in September 1954 as a member of the Field Test Division. He moved to the Full-Scale Field Test organization in 1957, and participated in nuclear weapons testing at NTS and in the South Pacific. In 1963, he worked on Air Force reimbursable programs. In 1969, he became a member of Sandia's satellite group, which later became the sensor system organization.

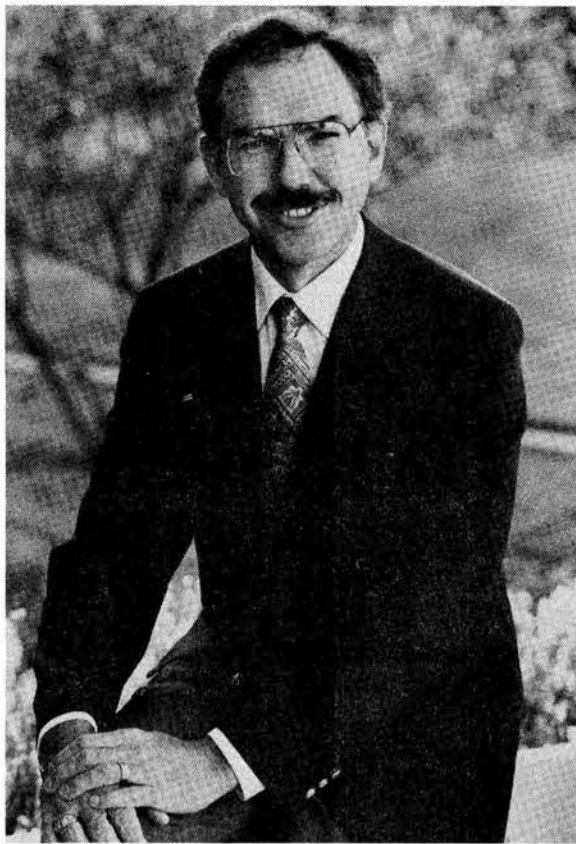
Bob has an AS in electronics from Idaho State College.

He enjoys hunting, fishing, and roping in his spare time and is active in the Southwest Roping Club.

He and his wife Beth live in Alameda. They have two grown children.

* * *

FRANK MASON to manager of Computing Systems Department 2630, effective Oct. 16.



FRANK MASON (2630)

Frank has been a member of the Computing organization since he joined the Labs in January 1968. In April 1980, he was named supervisor of the Data Processing Systems Design Division. In 1982, he transferred to the Scientific Operating Systems Division; three years later he moved to the Central Network Division. Frank was supervisor of the Network Analysis Division before his recent promotion.

He has a BS and MS in mathematics from East Texas State University, where he was an instructor and associate director of the computer center before coming to Sandia.

Frank's hobbies include photography and freshwater and marine aquariums. He is also involved in volunteer activities at his church, where he assists with audio systems.

Frank and his wife Betty live in the NE Heights. They have two children.

* * *



LINDA McEWEN (6000A)

LINDA McEWEN to Assistant to Vice President 6000, effective Sept. 1.

Linda joined the Labs in November 1983 as a member of the Budgeting organization and was the external budgeting liaison with DOE Headquarters, reporting on the federal budget status. She has also worked with Sandia's Energy Advisory Committee and Org. 6000 energy programs. Last January, she moved to the Employee Benefits Division, where her activities included life and corporate insurance program planning.

She has a BA in sociology from Rosary College in River Forest, Ill., and an MBA from the University of Arizona. She is a Certified Management Accountant.

In her spare time, Linda enjoys hiking, jogging, cross-country skiing, and travel.

Linda and her husband Neal (154) have one daughter and live in the SE Heights.



SANDIA is the federal prime contractor "that has provided the most significant and beneficial impact to the minority business community" in New Mexico in FY87, according to a letter from the US Small Business Administration (SBA). The achievement was no accident — with the assistance of Jon Bedingfield's Supplier Relations and Purchasing Information Div. 3731, Sandia's purchasing and line organizations worked to increase their own awareness of the capabilities of small, minority-owned, and women-owned businesses; at the same time, Jon's division worked through an outreach program to educate well-qualified members of these three groups about how to do business with Sandia and other federal labs. The result was that Sandia purchased \$437.9 million worth of goods and services from the three groups in FY87, up from \$333.4 million in FY86. This plaque, presented by SBA District Director Phil Ramos (right) to Dick Russell (3700), commemorates the achievement.



FORTUNATELY, PILOT AND PASSENGER walked away from this helicopter crash a couple of weeks ago in Coyote Canyon. AeroWest pilot Gene Wilson and Dennis Gutierrez (7535), who had been participating in a test at the cable site, were treated for cuts and bruises by Sandia Medical people at the scene. KAFB fire fighters responded, but luckily the helicopter did not burn. (Photo by Russell Smith, 3155)

Congratulations

To Lee and Steve (1531) Rottler, a daughter, Catlin Marie, Nov. 11.

To Gloria (7252) and Raymond Turrietta, a son, Richard Anthony, Nov. 15.

To Elesia and Brent (2341) Donham, a daughter, Lindsay Dence, Nov. 19.

Sympathy

To Richard Troncoso (6313) on the death of his father in Santa Fe, Oct. 1.

To Felix Garcia (7818) on the death of his mother in Tijeras, Nov. 3.

To Jim Asay (1534) on the death of his father in Fresno, Calif., Nov. 11.



AL GONZALES (second from left), director of the Management Support Division at DOE/AL, recently presented DOE's Award of Achievement to Sandia for meeting and exceeding safety goals in 1986. On hand for the presentation were (from left) Dr. Paul Mossman (3300), Bill Burnett (3310), and VP Dennis Roth (3000), who accepted the award plaque on behalf of the Labs. The award cited an outstanding safety record at all Sandia locations.

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

Deadline: Friday noon before week of publication unless changed by holiday. Mail to Div. 3162.

Ad Rules

1. Limit 20 words, including last name and home phone.
2. Include organization and full name with each ad submission.
3. Submit each ad in writing. No phone-ins.
4. Use 8 1/2 by 11-inch paper.
5. Use separate sheet for each ad category.
6. Type or print ads legibly; use only accepted abbreviations.
7. One ad per category per issue.
8. No more than two insertions of same ad.
9. No "For Rent" ads except for employees on temporary assignment.
10. No commercial ads.
11. For active and retired Sandians and DOE employees.
12. Housing listed for sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

THULE RACK SYSTEM for gutterless car roofs, locking, w/cycle rail, new. Pelzman, 828-1868.

CUSTOM-MADE COUCH, oak frame, natural tweed, w/5 pillows, \$350; water bed, \$100. Hesch, 268-6122.

ELECTRIC DIP STICK HEATER, \$3.50; truck rims; truck-bed liner for LWB, \$25. Padilla, 877-2116.

CUP WARMER, Dazey CW-10, for coffee or soup, desk or countertop, on/off switch, never used, \$4. Schkade, 292-5126.

TWO FISHER-PRICE CRIB PLAY GYMS, \$4/ea.; 2 Fisher-Price dancing animals musical mobiles, \$8/ea. Barr, 821-5870.

REFINISHED BABY CRIB w/mattress, \$65; antique double bedstead, natural oil finish, \$55. Ray, 294-7720.

COUCH AND LOVESEAT, rust color, \$100; other furniture. Robles, 298-2456.

AMIGO MOTORIZED WHEELCHAIR, w/charger, \$1200. Church, 299-2175.

WHIRLPOOL WASHER, 3/4-size, on wheels, \$65. van Berkel, 897-2541.

CLASSICAL GUITAR, sticker-laden case included, \$100. Rubio, 865-7971.

CAR SEAT, infant through 2 yrs., \$30. Lambert, 294-4188.

REFRIGERATOR/FREEZER, Hotpoint, family-size, \$65. Thornberg, 255-4966.

CORDLESS TELEPHONE, AT&T Nomad 250, \$25. Cropp, 296-1877.

POOL/PING-PONG TABLE, 1" slate, extras, \$525; 24 sheets unfinished ash, 1/4" x 4' x 8', \$275; DP Ultra Gympac, \$325. Stephens, 822-8584.

7mm MAUSER RIFLE, 7x57 bolt action, 3-9 Bushnell scope, cleaning kit, \$225. Meyer-Hagen, 293-7339.

BALDWIN PIANO, studio-size, 3 yrs. old, walnut finish, w/bench, \$1900 OBO. Sherman, 292-3297.

TOY POODLE, male, red, AKC w/papers, recently groomed, 21 months old, \$135. Allen, 298-9833.

CHILD'S SKIS & BOOTS: Rossignol 120 w/Tyrolia 60 bindings, \$45; Roces and Heierling, 3 pr., sizes 4 to 6-1/2,

\$15-\$25. Philbin, 828-2414.

WHITE SEWING MACHINE, 1940s, \$40; TI portable professional PC, MS-DOS, 256KB RAM, \$630 OBO; .30-cal. carbine, \$140 OBO. Grafe, 291-9692.

CROSS-COUNTRY BOOTS, Heierling, sizes 35 & 39; bowling shoes, Lady Dexter, size 7-1/2, new; king-size mattress, King Coil. Wagner, 823-9323.

OLYMPUS OM-PC 35mm CAMERA, w/f1.8 50mm lens, case, never used, \$195. Stark, 298-6139.

BABY CRIB w/springs and mattress, \$50; Ethan Allen Heirloom lamp table, maple, round, \$150. Duda, 292-2015.

RED SHAG CARPET w/pad, 19' x 19', \$50. Lachenmeyer, 268-7818.

KENMORE SEWING MACHINE, free-arm, zigzag, and stretch, \$75; full-size mattress, box spring, frame, \$75. Lukens, 299-1271.

AKC SIBERIAN HUSKIES, black & white (black masks), blue eyes, ready for Christmas, \$200/ea. Garrison, 281-1539.

COSCO CAR SEAT/infant seat carrier, washable cotton pad, used for 6 months, \$22. Barnette, 292-5186.

QUEEN-SIZE SLEEPER, sectional, tan, \$350; contemporary sofa, off-white, \$250; barrel chairs, mauve w/small print, \$75/ea. Atchison, 897-3289.

BATHROOM FIXTURES, 2 sets: 30" x 21" vanity sink, faucet, mirrored medicine chest w/light, \$125/set. Stoeber, 296-3717.

WURLITZER CONSOLE PIANO, fruit-wood finish, \$1450. Hunt, 299-5098.

ADJUSTABLE LADDER, 16-1/2", from Price Club, will trade for 12-1/2" model. Bowman, 299-5799.

ARMSTRONG STUDENT FLUTE, \$175 OBO. Bronkema, 821-2119.

WOOD-BURNING STOVE, \$225; Akai reel-to-reel 4000DS, \$225; Gibson refrigerator, brown, 19-cu.-ft., \$225; stereo cabinet, \$50. Gonzalez, 292-4054.

BUNDY CLARINET, \$150 OBO. Beard, 821-0309.

FLUKE MOD. 27Y DMM, \$150; 2 new Wards tires, P16580D13, \$18/ea.; 2 used Wards tires, P165-80B13, \$10/ea. Scranton, 869-6589.

GLASS FIREPLACE DOORS, new (still in box), call for dimensions, \$50/ea. Stuart, 265-7315.

WURLITZER SPINET PIANO w/bench, \$850 OBO. Slutz, 898-9462.

TELESCOPE, Odyssey 1 reflector, 13.1-in. mirror, Telrad spotter, 3 eyepieces, \$690. Grasser, 291-0947 or 292-3799.

CELLO, Kiso Suzuki, new Bobelock case, 2 bows, \$1700. Dalphin, 265-4029.

KITCHEN DINETTE SET: 42" x 47" table w/12" leaf, wood-grain Formica top, 4 tan vinyl swivel chairs, \$85. Rarrick, 296-2340.

S&W MODEL 29, 6" bbl., .44 mag., \$300; Savage Model 99, .300 cal., \$155; Remington .223 ammo, 500 rds., \$60. Greene, 299-4163.

TRAVEL TRAILER, Holiday Vacationer, 20-ft., self-contained, new awning & radial tires, Reese hitch, \$3600 OBO. Fleif, 299-2665.

WRITING TABLE, solid maple; car speaker, new; house paint & other items. Brockway, 247-9460 or 842-5326.

KIMBALL SPINET PIANO, mahogany,

approx. 20 yrs. old, \$300. Stein, 256-1752.

COINS: 1854 \$1 liberty-head gold piece, BU, \$200; '59-'64 proof sets; other silver coins and mint sets. Houston, 299-4118.

AG-TRONIC GENERATOR, 4000W, 1 yr. old, B&S engine, on wheels, \$400; photovoltaic panel, Photowatt, 55W, two 12V batteries, \$500. Douglas, 281-9843.

SKI RACK, gutter & luggage-rack mounts, \$60. Johnson, 298-8621.

PORTABLE SEWING MACHINE, \$25; oak-finish desk, \$100; shower curtain, blue, w/liner and spring rod, \$10. Pfeiffer, 299-3951.

AQUARIUM, 55-gal., wrought iron stand, filter, lighted hoods, food, plants, gravel, \$220. Chadwick, 889-0249.

CELLO w/bow & case, \$500; Litton 1.2-cu.-ft. microwave oven, \$100; 5' built-in bathtub, \$30. Anderson, 294-8451.

CHILDREN'S FURNITURE; dehydrator; water softener & electric water heaters; walnut divider; gas slide-in stove; mesh for concrete reinforcement. James, 292-1606.

SEWING CABINET w/auto-lift for Bernina 930, \$400; standard desk, walnut veneer, \$100; Sears 16" chain saw, \$100. Williams, 299-8986.

SKIS, Head 170cm, Tyrolia 280 bindings; Nordica boots, man's size 8; Raichle boots, woman's size 8, \$25. Wickesberg, 294-8334.

WOODEN WINDOW SHUTTERS, 4 prs.; twin-size mattress, box spring, frame. Schellenbaum, 881-7589.

BACH STRADIVARIUS TRUMPET, Model 37, mute, 3 mouthpieces, \$550. Thorne, 884-4870.

ACOUSTIC 220 BASS AMP, w/two 15" speakers, 5-band equalizer, 200W, \$1100 new, sell for \$600 OBO. Brooks, 883-1485.

COCKATIELS, gray & yellow, weaned, \$40/ea. Gasser, 255-6244.

AUTUMN HAZE MINK COAT, medium, appraised at \$4500, sell for \$1500. Allen, 296-6453.

BABY CRIB w/mattress, teething rail, bumper pad, \$80; 2 end tables, \$25; living-room chairs, make offer. Falacy, 293-2517.

OLYMPUS OM-PC CAMERA, 35mm, 1.8 lens, case, new in box w/warranty, \$220. Bentz, 299-3448.

STATIONARY EXERCISE BIKE, Sears, \$65. Navratil, 293-5527.

KENMORE MICROWAVE, programmable, w/defrost, temp. probe, memory, \$200. Cap, 294-2741.

VCR CAMERA, works, make offer. Bonahoom, 296-4450.

RIFLE, 308; shotgun, 410 over and under; 1873 Springfield Trapdoor, 45-70 cal.; octagon exerciser, never used, \$75. Jones, 888-1564.

TRANSPORTATION

'82 TOYOTA PICKUP, LWB, AT, AM/FM radio, AC, \$3600 OBO; '83 Datsun Maxima, 4-dr., loaded, brown, \$8400 OBO. Gallegos, 294-0233.

'86 FORD F-150, 6-cyl., 4-spd., AC, PS, PB, LWB, white, 1.4K miles, \$7700. Padilla, 842-8068.

'72 BRONCO, V-8, 3-spd., 4x4, 88K miles, new radials, \$3200 OBO. Welch, 292-2706.

'82 CHEVETTE, 4-dr., 1800 diesel

engine, needs body work, \$400. Cibicki, 877-7098.

'82 DODGE MAXIVAN, AC, 3-spd., OD, cruise, completely carpeted, NADA wholesale, Benson, 268-9727.

'81 FORD GRANADA, 4-dr. sedan, PS, AC, V-6, extras, \$2195. Martinez, 298-7382.

'76 DATSUN KING CAB, AM/FM, 4-spd., 1600cc, 107K miles, \$1200. Schlavin, 299-6592.

'82 FIREBIRD SE, louvres, AT, V-6, AC, tilt, bronze, \$3900 OBO. Johnson, 296-1917.

'72 WINNEBAGO "BRAVE" MOTOR-HOME, fully equipped, 413 CID, runs on gas or propane, \$7950. Johnston, 888-4375.

'83 HONDA ATC 70, \$275. Stephens, 822-8584.

'86 HONDA PRELUDE Si, 5-spd., AC, cruise, power sunroof, PW, white/charcoal interior, book value. Weinmaster, 298-1620.

'85 TOYOTA CAMRY DELUXE, 5-spd., AC, AM/FM cassette, PS, white exterior, gray velour interior, \$9000. Foty, 268-0412.

'83 SUZUKI GS750ED, 11K miles, \$1700; '84 Yamaha RZ350, \$1300. Romero, 892-5282.

GIRL'S 10-SPD. BICYCLE, yellow, Sears, 24", \$35. Cropp, 296-1877.

'80 DODGE DIPLOMAT SW, 65K miles, AT, luggage rack, \$2300. Herr, 281-9873.

'82 FORD VAN REDI-CAMPER, chrome wheels, AC, AT, 302 V-8, \$9500 OBO. Carrillo, 888-4869.

SCHWINN SPORTS TOURER, 24" frame, \$95; Diamond Back Formula I BMX, \$140 OBO; '83 Honda CR480, \$850; '72 Honda SL-350, \$250 OBO. Healer, 298-6967.

'80 TOYOTA COROLLA SW, new brakes, recent tune-up. Wright, 256-9210.

'73 VW SUPER BEETLE, wire wheels, flair fenders, new brakes/muffler/struts, \$2700. Morgan, 897-2445.

'85 NISSAN MAXIMA, gray w/cloth interior, 5-spd., 36K miles, loaded, \$9850 firm. Romero, 1-864-8730 (Belen).

'85 FORD BRONCO XLT (full-size), 4-spd., PS, PB, 34K miles, \$9000. Dwyer, 291-8466.

WOMAN'S TEN-SPEED BICYCLE w/fenders, \$85. Bartberger, 823-2843.

'73 PLYMOUTH FURY 3, 4-dr., w/trailer towing package, \$500 OBO. Houston, 299-4118.

'63 THUNDERBIRD; '65 Thunderbird. Kidd, 883-8535.

'86 GMC S-15 JIMMY, 4x4, 2.8 litres, 6-cyl., PS, PB, AC, below book. Johnson, 298-8621.

'51 HARLEY-DAVIDSON FL, \$4500. Adcock, 873-1821.

'60 DE SOTO, push-button AT, AC, PS, PB, 24K miles, garaged, original owner, light blue & white, \$3900 (book value) OBO. Dubicka, 296-6557.

FISHING BOAT, 14', 35-hp Evenrude engine, trailer, \$1800. Weber, 293-8196.

'79 3/4-TON VAN, front end damaged, sell as-is or parts. Houghton, 299-3386.

'83 CHEV. PICKUP, Scottsdale, 4-WD, AC, PS, dual tanks, 24K miles, w/matching Admiral camper shell, \$9500. Falacy, 293-2517.

'81 JETTA, AC, AM/FM cassette, 5-spd., fuel injection, \$2500; '77 Buick LeSabre, V-6, all power, cruise, radio,

\$800. Bonahoom, 296-4450.

'79 JAGUAR XJ6, 4-dr. sedan, series III, white/red leather interior, \$10,500. Ewing, 268-6920.

REAL ESTATE

3-BDR. MOBILE HOME, 16' x 77', 2 baths, stove, refrigerator, dishwasher, disposal, FP, no down/take over payments. Gabaldon, 864-1864.

3-BDR. WEISER HOME, Four Hills area, many extras, 8% interest, flexible terms, \$133,000. Gallegos, 294-0233, appointment only.

CUSTOM HOME on 1 acre (2nd acre available), far NE Heights, indoor pool, horses allowed, owner financing, \$176,900. Baker, 294-3334.

3-BDR. CUSTOM HOME on 1 acre, Corrales, 2 baths, exposed vigas & beams, custom oak cabinets, fully fenced, horses allowed, \$158,000. Martin, 897-7660.

3-BDR. HOME, 2-1/2 baths, den, LR, DR, 2750 sq. ft., city view, \$199,500. Martinez, 298-7382.

3-BDR. HOME, North Valley, assumable FHA loan, no qualifying, down payment negotiable, REC. Damler, 345-0954.

3-BDR. HOME on 1 acre, Los Lunas, 1-3/4 baths, 1700 sq. ft., irrigated, fenced, barn (stables & kennels), \$83,000. Hart, 821-4455.

3-BDR. HOME, 1-3/4 baths, 1457 sq. ft., FHA 9.5% assumable, \$89,900; 4-bdr. home, 3 baths, 2400 sq. ft., \$159,000, must refinance. Eldredge, 298-3520.

4-BDR. HOME, 2-1/2 baths, 3200 sq. ft., FR, DR, LR, game room, FP, on cul-de-sac, Academy Estates. Dawes, 821-8155.

3-BDR. CUSTOM HOME, Taylor Ranch, great room w/FP, DR, 2 baths, 2-car garage, 1750 sq. ft., 9-1/4% assumable ARM, \$107,000. Zurzolo, 898-1175.

4-BDR. HOME, Heritage East, 1 yr. old, LR, DR, FR w/FP, 2 baths, 2-car garage, landscaped w/sprinklers in front, 2000 sq. ft., \$148,000. Dobias, 822-0013.

4-BDR. HOME, passive solar, 2400 + sq. ft., 1-1/2 irrigated acres, Tome area, sun room, double garage, tiled floors, deck, \$125,000. Martinez, 865-6983.

WANTED

HOUSEMATE, female, share home 8 blocks north of I-40 on West Mesa, courtyard, hot tub, \$250/mo. plus 1/3 utilities. Rivers, 836-6304.

FIREBIRD FORMULA or Trans Am, '70-'74, 4-spd., 400/455 engine, will consider car in any condition. Cowen, 296-5980.

STONEWARE by Fabric, "Agate Pass" pattern. Robertson, 299-7561.

SNOWSHOES, wooden or aluminum, good condition. Brown, 293-3941.

HOUSEMATE, nonsmoker, share house in Tijeras area, \$275/mo. plus 1/2 utilities. Finley, 281-2826.

UPRIGHT VACUUM CLEANER, good condition. Douglas, 281-9843.

NEW MEXICO MAGAZINE, Oct. '87 issue. Shane, 294-4920.

Better Not Pout, Better Not Cry — On Dec. 12, You'll Know Why

S. CLAUS puts in his annual appearance at the children's Christmas party on Saturday, Dec. 12, from 10 a.m. to noon. Kids who haven't shaped up thus far this year had better polish those halos between now and then! Entertainment, besides a visit with jolly jelly-belly, includes holiday tunes sung by a local high school group and a clown magic show. Each child gets a special gift, and door prizes will be awarded. Admission is one can of food or \$1, to be donated to the Salvation Army. It's limited to members' kids only, so don't forget the membership card.

SKI THE SLOPES IN STYLE this year, once you've attended the Coronado Ski Club's meeting on Dec. 15 from 7 to 9 p.m. Several sporting goods stores show what's hot in schussboomer attire, and there'll also be a film, "Sunshine and Good Snow," from Rossignol. Christmas goodies from 7 to 7:30, followed by the program. December trips include Purgatory, Dec. 11-13; Sunrise, Dec. 18-20; and Utah, Dec. 28-Jan. 1.

THUNDERBIRDS GET TOGETHER for their annual Christmas party from 1 to 4 p.m. on Sunday, Dec. 13. This retired — but untired — bunch, as usual, plans a swinging celebration. Free snacks accompany libations from the no-host bar, and everybody's favorite music-maker — Bob Banks — provides background tunes all afternoon.

Speaking of T-Birds, the happy shufflers — also

known as T-Bird card sharks — meet for fun and games (and *another* Christmas party) on Dec. 17, starting at 10:30 a.m. Come on out and wish everyone a merry, merry . . .

And more . . . Those big wheels (T-Bird Roadrunners RV group, for those not in the know) plan to head for the mountains on Saturday, Dec. 12, for a Christmas party at Bella Vista restaurant. Contact your friendly wagon masters for more info and reservations: Bill Minser (299-1364), Duane Laymon (822-1749), or Tom Brooks (344-5855).

SAY HELLO TO 1988 in style at the C-Club on New Year's Eve from 7 p.m. to 1 a.m. Two outstanding bands — Freddie Chavez Foundation and Crossover Country Western — provide dance music in the ballroom and Eldorado room, respectively. Add noisemakers, hors d'oeuvres, and a full breakfast (with complimentary bottle of champagne), and you have quite an evening on your hands. Hurry on that reservation; Dec. 16 is the last day to pick up tickets. Give the office a call right now (265-6791).

DON'T MISS THE ONE-AND-ONLY Friday night special dinner this month (and C-Club Christmas party) on Dec. 18. Choose either prime rib or snow crab — elegant entrees both. Afterwards, the Isleta Poor Boys provide stomp music from 8 to midnight. Dinner reservations requested.

Take Note

This month's meeting of the American Institute of Aeronautics and Astronautics (AIAA), Albuquerque Section, on Dec. 11 features a talk by AIAA lecturer Marcia Smith, a specialist in aerospace systems at the Library of Congress's Congressional Research Service. The topic is "Soviet Space Activities: Are They Ahead?" The meeting is at the Holiday Inn Midtown at 8:30 p.m. (6:30 social hour, 7:30 dinner). Cost is \$12.50/members and their guests, \$15/nonmembers, and \$7.50/students. Contact Brian Landrum (1555) on 4-0119 or Gary Polansky (1553) on 4-9690 for more information.

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If you attend Artfest '87 on Dec. 4-6 at the NM State Fairgrounds, be sure to stop by Booth 131 in the Agricultural Bldg. and see the display of paintings done by Sandia artist Faith Perry (3155).

* * *

Frank Collins of the Albuquerque Corps of Engineers is the speaker at a lunch meeting of the Society of American Military Engineers, Albuquerque Post, at 11:30 a.m. on Dec. 9 at the KAFB Officer's Club West. Collins's topic is the Corps' readiness status in the event of a natural or national disaster, including what procedures are used in emergency procurement. Call 844-8205 for reservations.

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The annual "Hanging of the Greens" celebration at First United Methodist Church (4th & Lead SW) is Dec. 5 (4:30 p.m.), Dec. 6 (4 & 7:30 p.m.), and Dec. 7 (7:30 p.m.). Theme this year is "A Christmas Fantasy"; the program features a cast/crew of more than 150 and a giant "living Christmas tree" filled with 100 singers. Sandia performers include Doris Hoffman (9110), John Long (2644), Betty Mowery (7543), Rich Carson (2531), Ann Yates (5255), Bonnie Hardesty (132), and Dennis Croessmann (6248). Those behind the scenes include Gary Shepherd (2614), lighting design; John Mareda (2643), special effects; and Colin Selleck (1411), one of the two stage managers. Though all the free tickets are currently spoken for, "no-show" seating will be opened 20 minutes before each performance to those without tickets.

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Walt von Riesenmann (6442) was recently invited to become a member of the Board of Directors of the American Assn. for Structural Mechanics in Reactor Technology. Walt's board term runs until Aug. 1989.

Events Calendar

- Dec. 4-5 — Student dance concert (presented by UNM Theatre Arts Dept.), 8 p.m., Rodey Theatre, 277-4402.
- Dec. 4-5 — "Nutcracker Ballet," presented by Albuquerque Ballet Co.; 7:30 p.m., KiMo Theatre, 265-8150.
- Dec. 4-5, 11-12 — Madrigal Yuletide Feaste, 6 p.m., UNM Student Union Bldg., 277-7884.
- Dec. 4-6 — "Messiah," New Mexico Symphony Orchestra Sinfonietta & Chorus; 7:30 p.m. Fri. at St. Thomas Aquinas Church (Rio Rancho), 7:30 p.m. Sat. at Central United Methodist Church (University & Copper NE), 3 p.m. Sun. at Simms Fine Arts Center (6400 Wyoming NE); 842-8565.
- Dec. 4-13 — "A Christmas Carol"; 8 p.m. Thurs.-Sat., 6 p.m. Sunday; Keystone Theatre (3211 Central NE), 255-6819.
- Dec. 4-20 — "Christmas on Mars," play by Harry Kondoleon; 8 p.m. Fri.-Sat., 6 p.m. Sun.; Vortex Theatre, 247-8600.
- Dec. 5 — Old-time band music by the New Mexico Folk Music Society, 8 p.m., Heights Community Center (823 Buena Vista SE), 256-1998.
- Dec. 6 — UNM Wind Ensemble concert, 4 p.m., free, Keller Hall, 277-4402.
- Dec. 6 — Steel drummer Andy Narell, presented by New Mexico Jazz Workshop; 8 p.m., KiMo Theatre, 255-9798.
- Dec. 6 — UNM Early Music Ensemble concert, 8:15 p.m., free, Keller Hall, 277-4402.
- Dec. 8 — University Symphony Orchestra concert, 8:15 p.m., Popejoy Hall, 277-3121.
- Dec. 8-9 — "Sor Maria," chamber opera/dance by Michele Larsson and Joseph Weber of Santa Fe; 8 p.m., KiMo Theatre, 848-1374.
- Dec. 9 — Christmas/Hanukkah concert for seniors, noon, free, KiMo Theatre, 881-0844.
- Dec. 10-12 — "Los Pastores," traditional New Mexico folk play, presented by La Compania de Teatro de Albuquerque; 8 p.m., KiMo Theatre, 242-7929.
- Dec. 11-12 — Classical Concert Series: New Mexico Symphony Orchestra playing music of Beethoven, Schumann, and Webern; Leslie Parnas, cello soloist; 8:15 p.m., Popejoy Hall, 842-8565.

- Dec. 11-13 — "Rapunzel," musical comedy version of the familiar children's tale; 7:30 p.m. Fri.-Sat., 2 p.m. Sun.; special group rates, Albuquerque Little Theatre, 242-4750.
- Dec. 12-13 — "The Amazing Bone," bilingual play for all ages, 2 p.m., Old Town Puppet Theatre (328 San Felipe NW), 243-0208.
- Dec. 15 — Annual holiday concert, presented by the New Mexico Symphony Orchestra; 7:30 p.m., Kiva Auditorium, 843-1374.
- Dec. 16-18 — "A Christmas Carol," new adaptation of the Dickens classic, presented by the New Mexico Repertory Theatre; 8 p.m., KiMo Theatre, 843-4500.



IT'S NOT THE UNIFORMS that make flag football players. Contrary to the shirts, it was the Rhinos that took first place in the 1987 flag football competition. Celebrating their 9-0 season are (back row, from left) Jo Bridge (7482), Doug Abrams (7481), Andrew Sanchez (DOE), Daryl Reckaway (7482), Brian "The Natural" Philipbar (3311), and Coach Kraig McKee (7481); (front row) Dave Szklarz (6315 contractor), Tom Davis (7472), Joe Sanchez (7482), Terry Smith (7483), and Mark Stavig (6232).